

**ABSTRACT OF THE DISCLOSURE**

The present technique provides for the generation of density maps using one or more basis material decomposition tables or functions. The basis material decomposition tables or functions are generated by simulating the system response to various lengths of basis materials using component characteristics of the CT system as well as the attenuation coefficient for the desired basis material. Measured projection data may be processed using the basis material decomposition tables or functions to provide a set of density line-integral projections that may be reconstructed to form a density map or image.